

WHAT IS CLAIMED IS

1. An electric machine comprising:

a rotor;

a stator;

cylindrical permanent magnets disposed tangentially on a circumference of said rotor;

support elements coupling said cylindrical permanent magnets to said rotor;

an interlocking facility disposed in a radial direction between said support elements of said cylindrical permanent magnets and said rotor;

electric coils individually fitted on said stator, wherein said electrical coils which do not have an iron core, wherein at least one section of said electric coils extends transversely across said circumference of said rotor and wherein said electric coils are bent so that said electric coils extend on both axial sides of said rotor and surround said cylindrical permanent magnets;

wherein said electric coils and said cylindrical permanent magnets influence each other when said rotor revolves.

2. The electric machine according to claim 1, wherein said electric coils have a Ω -shaped cross-section and said cylindrical permanent magnets are immediately next to an inside of said

electric coils.

3. The electric machine according to claim 1, wherein said support elements are attached to said rotor in such a way that said support elements can be replaced.

4. The electric machine according to claim 1, wherein said cylindrical permanent magnets and said support elements are attached to said rotor so that said cylindrical permanent magnets and said support elements can be removed in an axial direction.

5. The electric machine according to claim 1, further comprising connections for said coils disposed so that they are accessible individually at said stator during assembly, operation and for service purposes.

6. The electric machine according to claim 1, wherein said cylindrical permanent magnets are arranged so that successive cylindrical permanent magnets have different polarities.

7. The electric machine according to claim 1, further comprising a pole reversal device disposed in a supply line to said electric coils.

8. The electric machine according to claim 1, wherein said electric coils are annular and profiles of said rotor and said electrical coils are adapted to each other.

9. The electric machine according to claim 1, wherein several rotors and coil configurations are located behind each other in an axial direction of the electric machine.

10. The electric machine according to claim 1, wherein at least two machines preferably in the form of motors with different diameters are located behind each other on a mutual machine shaft.

11. The electric machine according to claim 1, wherein said electric coils are formed from several coil layers that are only one wire layer thick.

12. The electric machine according to claim 11, wherein a connection for said several coil layers is wired individually and is designed to be connected in series and parallel.

13. The electric machine according to claim 11, wherein said several coil layers are glued together with an adhesive that conducts heat effectively.

14. The electric machine according to claim 1, further comprising a cable support on a circumference of the rotor - stator assembly.

15. The electric machine according to claim 1, wherein said interlocking facility holds said cylindrical permanent magnets securely in an axial direction of said rotor, absorbing centrifugal forces acting in a radial direction of said rotor.

16. The electric machine according to claim 1, wherein a number of said cylindrical permanent magnets is two times a number of said electric coils.